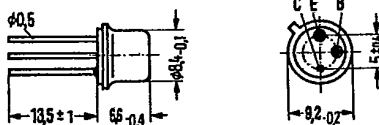


PNP Silicon Planar Transistor

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2 N 4033 is an epitaxial PNP silicon planar transistor in TO 39 case (5 C 3 DIN 41873). The collector is electrically connected to the case. The transistor is particularly intended for use in AF amplifiers and for AF switching applications up to 1 A.

Type	Ordering code
2 N 4033	Q62702-S154



Approx. weight 1.5 g

Dimensions in mm

Maximum ratings

Collector-base voltage	$-V_{CBO}$	80	V
Collector-emitter voltage	$-V_{CEO}$	80	V
Emitter-base voltage	$-V_{EBO}$	5	V
Collector current	$-I_C$	1	A
Junction temperature	T_j	200	°C
Storage temperature range	T_{stg}	-65 to +200	°C
Total power dissipation ($T_{amb} \leq 25^\circ\text{C}$)	P_{tot}	0.8	W
Total power dissipation ($T_{case} \leq 25^\circ\text{C}$)	P_{tot}	4	W

Thermal resistance

Junction to ambient air	R_{thJA}	≤ 220	K/W
Junction to case	R_{thJC}	≤ 44	K/W

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Static characteristics ($T_{amb} = 25^\circ\text{C}$)

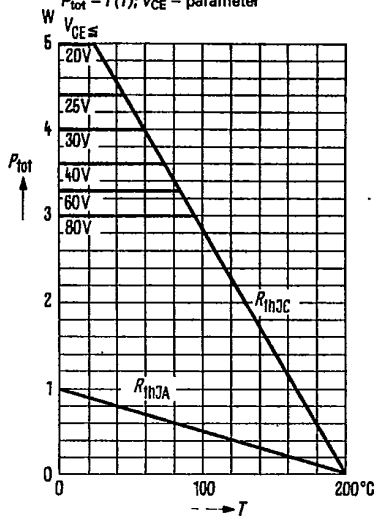
Collector-base breakdown voltage ($-I_C = 10 \mu\text{A}$)	$-V_{(BR)CBO}$	> 80	V
Collector-emitter breakdown voltage ($-I_C = 10 \text{ mA}$)	$-V_{(BR)CEO}$	> 80	V
Emitter-base breakdown voltage ($-I_E = 10 \mu\text{A}$)	$-V_{(BR)EBO}$	> 5	V
Collector-emitter saturation voltage ($-I_C = 150 \text{ mA}, -I_B = 15 \text{ mA}$)	$-V_{CEsat}$	< 0.15	V
($-I_C = 500 \text{ mA}, -I_B = 50 \text{ mA}$)	$-V_{CEsat}$	< 0.5	V
Base-emitter saturation voltage ($-I_C = 150 \text{ mA}, -I_B = 15 \text{ mA}$)	$-V_{BEsat}$	< 0.9	V
($-I_C = 500 \text{ mA}, -I_B = 50 \text{ mA}$)	$-V_{BEsat}$	< 1.1	V
Collector cutoff current ($-V_{CBO} = 60 \text{ V}$)	$-I_{CBO}$	< 50	nA
($-V_{CBO} = 60 \text{ V}, T_{amb} = 150^\circ\text{C}$)	$-I_{CBO}$	< 50	μA
Emitter cutoff current ($-V_{EBO} = 5 \text{ V}$)	$-I_{EBO}$	< 10	mA
DC current gain ($-V_{CE} = 5 \text{ V}, -I_C = 100 \mu\text{A}$)	h_{FE}	> 75	-
($-V_{CE} = 5 \text{ V}, -I_C = 1 \text{ mA}$)	h_{FE}	> 25	-
($-V_{CE} = 5 \text{ V}, -I_C = 100 \text{ mA}$)	h_{FE}	100 to 300	-
($-V_{CE} = 5 \text{ V}, -I_C = 100 \text{ mA}, T_{amb} = 55^\circ\text{C}$)	h_{FE}	> 40	-
($-V_{CE} = 5 \text{ V}, -I_C = 500 \text{ mA}$)	h_{FE}	> 70	-

Dynamic characteristics ($T_{amb} = 25^\circ\text{C}$)

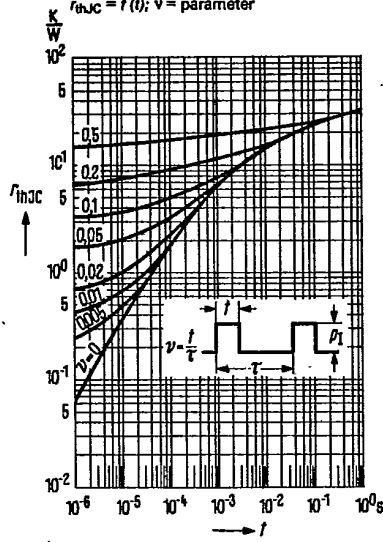
Transition frequency ($-V_{CE} = 10 \text{ V}, -I_C = 50 \text{ mA}, f = 100 \text{ MHz}$)	f_T	> 150	MHz
Collector-base capacitance ($-V_{CBO} = 10 \text{ V}, f = 1 \text{ MHz}$)	C_{CBO}	< 20	pF
Emitter-base capacitance ($-V_{EBO} = 0.5 \text{ V}, f = 1 \text{ MHz}$)	C_{EBO}	< 110	pF
Switching times: ($-V_{CC} = 30 \text{ V}, -I_C = 500 \text{ mA}, -I_{B1} = I_{B2} = 50 \text{ mA}$)			
Turn-on time	t_{on}	< 100	ns
Storage time	t_s	< 350	ns
Fall time	t_f	< 50	ns

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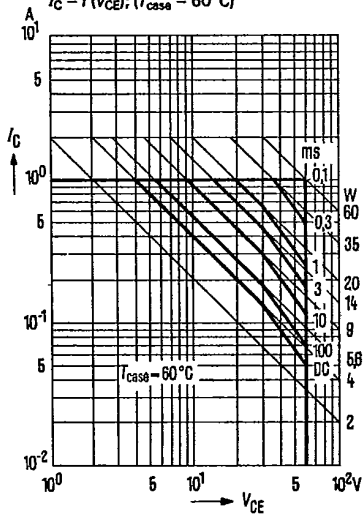
Total perm. power dissipation versus temperature
 $P_{tot} = f(T); V_{CE} = \text{parameter}$



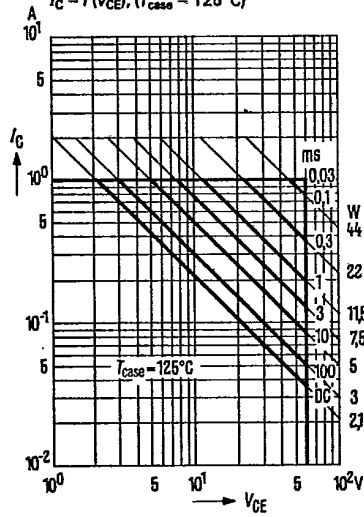
Permissible pulse load
 $r_{thJC} = f(t); v = \text{parameter}$



Permissible operating range
 $I_C = f(V_{CE}); (T_{case} = 60^{\circ}\text{C})$

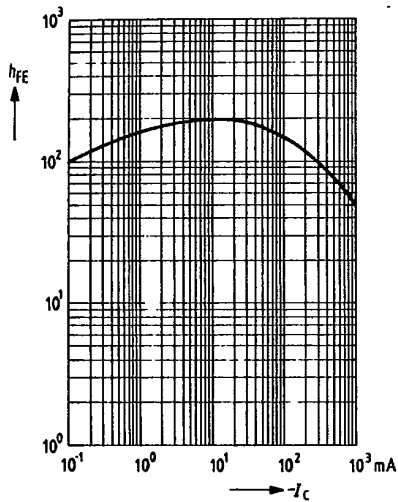


Permissible operating range
 $I_C = f(V_{CE}); (T_{case} = 125^{\circ}\text{C})$

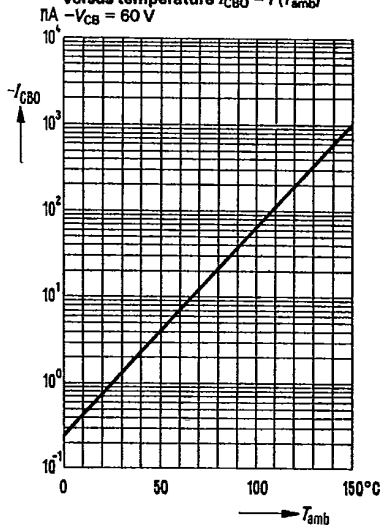


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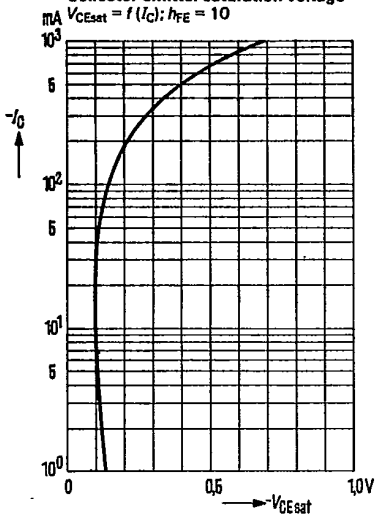
DC current gain $h_{FE} = f(I_C)$
 $V_{CE} = 5\text{ V}; T_{amb} = \text{parameter}$



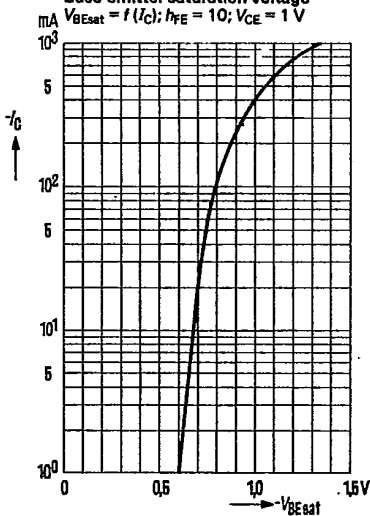
Collector cutoff current
 versus temperature $I_{CBO} = f(T_{amb})$
 $-V_{CB} = 60\text{ V}$



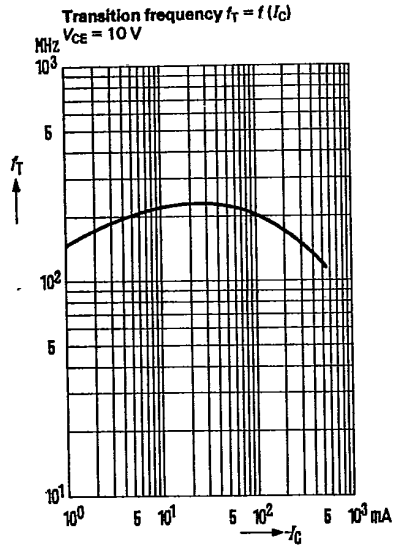
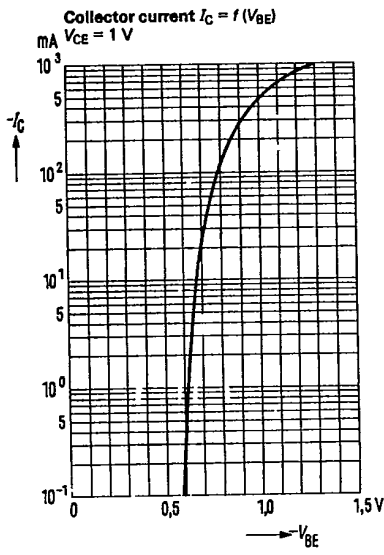
Collector-emitter saturation voltage
 $V_{CEsat} = f(I_C); h_{FE} = 10$



Base-emitter saturation voltage
 $V_{BEsat} = f(I_C); h_{FE} = 10; V_{CE} = 1\text{ V}$



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Test circuit for switching times

